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PLAN TO WIN
THE SUPPLY CHAIN PLANNER'S PLAYBOOK
How to get results that exceed even the most demanding boss's expectations

DASSAULT SYSTEMES

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Maximizing the ROI in your supply chain, by Lora Cecere

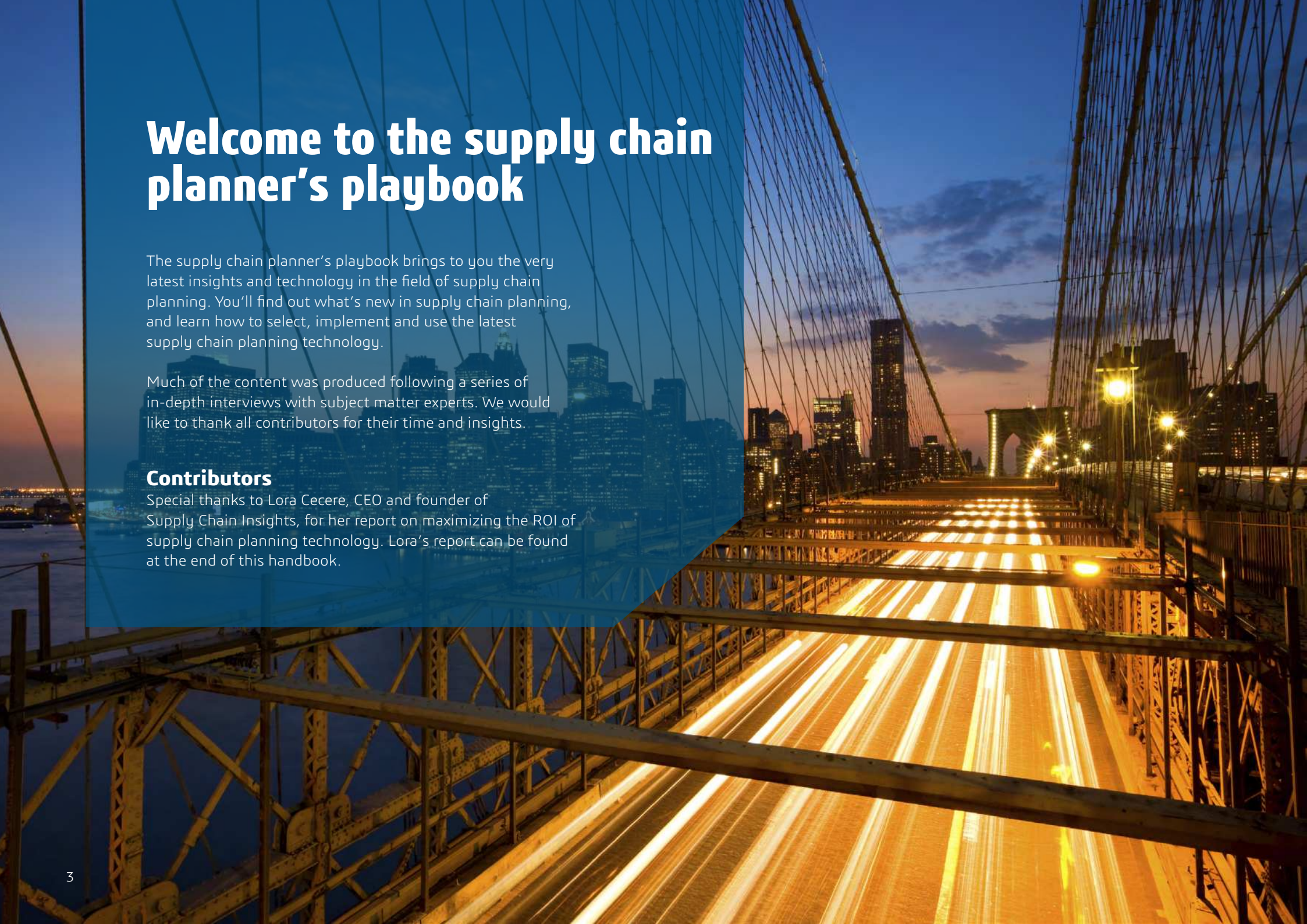
Welcome to the supply chain planner's playbook

The supply chain planner's playbook brings to you the very latest insights and technology in the field of supply chain planning. You'll find out what's new in supply chain planning, and learn how to select, implement and use the latest supply chain planning technology.

Much of the content was produced following a series of in-depth interviews with subject matter experts. We would like to thank all contributors for their time and insights.

Contributors

Special thanks to Lora Cecere, CEO and founder of Supply Chain Insights, for her report on maximizing the ROI of supply chain planning technology. Lora's report can be found at the end of this handbook.



Supply chain planning: Then & now

About 100 years ago, Frederick Taylor created history by separating planning from production. He was the first person to create a planning office with well-defined roles.

There was someone to create production routes.

Another person to ensure that the relevant raw materials were available.

Yet another person to track the orders and update the status of tasks.

And, of course, someone had to ensure that everyone knew exactly what had to be done and when. (This was achieved with the help of large bulletin boards in the planning office and on the shop floor.)

Supply chain planning had finally been organized.

If Taylor organized supply chain planning, it took his colleague, Henry Gantt, to recognize the importance of organizing the way information was presented to planners. Gantt was the father of the Gantt chart—a graphical overview of production orders that enabled planners to see where the bottlenecks were. With a Gantt chart, planners could change sequences and see the effect of their changes. Today, Gantt's invention is still going strong in companies that schedule production.

After that flurry of innovation, nothing much changed for decades. Then, somewhere in the 90s, companies and universities began exploring how to apply complex mathematical algorithms to maximize production capacity. The new era of supply chain optimization had arrived.

Some successes were achieved, but practical, real-world benefits were few and far between. Often the algorithms assumed that the problem to be optimized was a standard problem. And as anyone who has ever worked in production knows, production problems are rarely 'standard'. The results were usually limited to highly successful optimizations of fantasy worlds that bore little relation to the reality on the shop floor.

How things have changed.

DELMIA Quintiq began with the premise that it should be possible to optimize even unique production problems with standard software. Today, this innovative approach to supply chain planning and optimization has proven to be of enormous value. Leading companies worldwide are experiencing the benefits of deep optimization over multiple production steps, multiple facilities and even entire supply chains. This kind of optimization has led to significant improvements in their KPIs and bottom line.

What's new in supply chain planning?

The easy answer, of course, is optimization. The interesting answer is that the legacies of Taylor and Gantt live on today in the way supply chain planning solutions are implemented.

It's still important to define the right roles. What impact will the system have on how planning is organized? Who's going to make which decisions and why? There are no 'right' answers here — only the most appropriate answer given a company's unique circumstances.

It's still crucial to ensure visibility. Will the system support planners in making well-informed, high quality decisions? If planners aren't able to see the impact of their decisions, they could be in danger of achieving a local optimum at the expense of the company's global KPIs.

And finally, there's a new focus on transforming bottom lines through optimization. Will the optimization actually lead to improved KPIs? This is critical as automated decisions do not necessarily help companies exploit their unique, but hidden, optimization potential.

Supply chain optimization 101

Optimization or automation: Which do you need?

It's easy enough to confuse automation with optimization. In both cases, you press a button, wait a few seconds, and whoops…there's your result. But while the external actions look alike, the results are very different.

What automation really automates

Automation automates what human planners do. So what do planners do?

Planners oversimplify.

To cope with the overwhelming complexity of supply chain planning, planners base their decisions on simple rules of thumb or heuristics. For example, a planner who is assigning shipments to trucks is probably going to follow a rule such as 'nearest next delivery'. When picking the next shipment to be assigned, the planner will look for the nearest delivery address to the previously assigned shipment.

It's easy enough to automate such a rule, but the results will be disappointing for at least three reasons:

1 The real world isn't simple: The rule has ignored a whole host of constraints, rules and regulations, customers preferences — and the list goes on.

2 It's not the best plan because many options (in this case, better routes) have not been considered.

3 You have no idea how the plan affects your KPIs.

The advantages — and limitations — of optimization

Optimization considers a huge array of possible combinations to arrive at a result that no human planner could ever hope to achieve. It incorporates all constraints, business rules, regulations and preferences; and enables planners to optimize plans based on the KPIs that need improving.

In an ideal world, optimization would be enough. In the real world of changing circumstances and constant disruptions, optimization needs to be supplemented with something else.

Suppose a driver is delayed for 30 minutes and is going to be late for the next delivery. What should be done? Should the driver skip the next delivery? Or should he or she make the next delivery in spite of the knock-on effect this will have on subsequent deliveries?

In situations where the disruption is relatively small, global or even local re-optimization would be an overkill. Any small improvement in KPIs would be outweighed by the pain of re-optimizing the original plan.

What planners need is an intelligent system that will help them grasp the impact of the disruption, and offer suggestions on how to solve any problems that arise.

This kind of decision support helps planners respond effectively to changing circumstances by:

- Calculating all the consequences of a disruption or change of plan
- Flagging problems that need to be resolved
- Suggesting solutions
- Highlighting how the decisions will affect KPIs

Optimization and decision support: The combination that's 'real-world ready'

It's no surprise then that combining optimization with decision support produces the best results. You get the advantages of optimization, while ensuring that planners can step in and tweak plans when necessary.

After all, the best way to ensure that an optimized plan can be implemented is to make sure it can be revised.

Top myths about optimization

Busting the half-truths that keep you from maximizing your returns

Dramatic improvements across KPIs — even in enterprises that are already industry leaders — are possible with effective optimization. The key word is 'effective'. At best, ineffective optimization leaves money on the table. At worst, it produces 'solutions' that are so divorced from reality that they cannot be used. The difference between good optimization and great optimization can run to millions of dollars in savings.

The myths and the myth busters

The optimization myth busters revealed here are common knowledge at DHL, TNT, the Federal Aviation Administration, Novelis and Wallenius Wilhelmsen Logistics. Read on to discover what these leading organizations know about effective optimization.

Myth: ***It's about locating the mathematically optimal solution***

Fact: ***It's about maximizing business value***

Effective optimization balances the time taken to solve a problem with the quality of the solution. In any quest for 'the optimal' solution, it's important to remember that the quality of optimization increases rapidly at the beginning of a search, and then plateaus. Any additional time spent results in relatively minor improvements.

To maximize business value:

Look for practically optimal solutions

The best solutions use clever shortcuts to deliver excellent results in a relatively short time. The exact timeframe depends on the particular planning challenge. To take an extreme example, a home delivery service must optimize and re-optimize orders in real time. An approach that takes 30 seconds to achieve a solution that is 99% optimal, is far more useful than one that takes 30 minutes to achieve 99.2% optimality. With new orders coming in constantly, such a solution will be overtaken by events even before it is created.

Focus on high-impact KPIs

Not all KPIs are created equal. There are those that contribute significantly to your bottom line—and those that don't. Effective optimization zeroes in on high impact KPIs. This focus on business value is crucial, as seemingly minor details can have a dramatic effect on computational complexity. For example, if most of your savings come from minimizing empty kilometers, you should focus on optimizing that KPI. Attempting to maximize cheap refueling as well (e.g. by refueling in countries where fuel is cheaper) will simply increase the time taken to solve the problem — without necessarily improving the result.

Require a 'perfect fit' with your business rules

An optimizer that

- doesn't 'know' about some of your business rules
- can produce better KPIs by violating those rules

will exploit this weakness. For example, it may assume that your depot and loading area are in exactly the same place, or that a late delivery is the same as a non-delivery. On the other hand, an optimizer that accommodates all your specific rules and constraints will enable you to

- capitalize on your competitive differentiators
- minimize costs

Optimization alert:

Many planning tools solve problems that fit the optimizer exactly but fail when the problem is even slightly different. Reject solutions that limit your planning to fixed, predefined rules. Prefer solutions that capture all relevant rules, and accommodate new ones effortlessly. This '100%-fit' with your operations is crucial to achieving your goals.

Myth: ***It's about automated planning***

Fact: It's about interactive automated planning

Black box optimizers that 'spit out' answers do not inspire confidence. Planners need to interact with the system, working with it rather than for it. Planners can make an optimal plan even better. For example, in a situation where it is clear that some orders will be late, the planner—but not the optimizer—will know which customers are willing to tolerate late orders, and which aren't. While it is possible to create a table for the optimizer that defines which customers should be given priority, this should be avoided. It is far quicker for planners to intervene manually than to keep updating such a table.

Disruptions require selective optimization

Disruptions may make it impossible to optimize the entire plan. Planners who can choose where to apply optimization can react swiftly to unexpected events, and minimize their impact. Plans should be refined to reflect changing circumstances. Planners who are in control can configure the optimizer to capture changing priorities, for example by prioritizing due dates at the expense of inventory levels or vice versa.

Effective optimization isn't about pushing a magic button, and hoping for the best. It's about creating the best plan by combining a knowledgeable planner with a practical, business-focused approach to optimization.

How-to guides

Prepare for supply chain disruptions

The butterfly effect

The "butterfly effect" was a term coined by mathematician, meteorologist and chaos theory expert Edward Lorenz around 1960. It refers to how one small incident can have a huge impact later on down the line.

The recent West Coast ports cargo-handling disruption is an example of the butterfly effect. The labor dispute caused freight bottlenecks. Companies using West Coast ports had to spend additional millions to cover extra inventory costs and shipping delays. US trade deficits rose to a massive $46 billion in December 2014.

Have you got what it takes to bounce back?

Labor disputes, bad weather, and IT outages are just some examples of disruptions that could affect an otherwise well-designed supply chain. They are unpredictable, inevitable, and can cause substantial damage to business operations and financial performance.

What do you do when a wrench is thrown in the works? Scrambling for solutions puts you at risk for being left behind your competitors.

What you need is a supply chain that is designed to be ***resilient*** in the face of disruptions.

But what makes a supply chain resilient?

Good decisions are crucial, but agility is key to staying ahead of the game

End-to-end visibility

The foundation of a resilient supply chain is end-to-end visibility. While most businesses already have some sort of visibility, end-to-end visibility helps planners detect problems that could happen at second- and third-tier supplier levels. Your direct supplier may not be able to cater to a sudden surge in demand if their suppliers in China have halted operations due to a flood. Knowing the impact of disruptions up and down the supply chain is crucial to making the right remedial decisions. Extended visibility gives you the power to avoid hitting snags, or worse, coming to a complete halt.

Contingency plans

There is a Malay proverb that goes something like this: "Prepare an umbrella before it rains". What if one of your main suppliers goes bankrupt — do you have backup suppliers? What if a manufacturer has to stop operations for a day because their machinery broke down — do you have enough safety stock to last until operations resume? Supply chains need several contingency plans that can be put into place when something unexpectedly goes wrong.

Agility

While contingency plans can save you from total disaster, agility is the flexibility and speed at which your supply chain can adapt to changes. The way your decisions flow through the supply chain needs to be fast and accurate, so that you can immediately respond to customer demands. Your supply chain needs to be flexible enough to be able to implement the changes. Good decisions are crucial, but agility is key to staying ahead of the game.

Optimized plans

Are you making the most of your supply chain? Optimization is about making sure that you're utilizing your resources in the most effective manner, without compromising rules and KPIs. For example, is your safety stock at the right level or is it leading to unnecessary costs? Can you reduce the idle time of your workforce to improve productivity without violating labor rules? An optimized plan is something that can only work if it takes into consideration constraints, business rules, and KPIs, so that you can measure the outcome of your decisions and improve upon them.

Disruptions come in all shapes and sizes

When disruptions occur in an environment that is already so competitive and unpredictable, businesses can't afford to scramble for solutions at the last minute. A resilient supply chain is key to nipping problems in the bud, minimizing damage, and staying ahead of competitors in times of trouble.

Become a demand-forecasting expert

Let's face it. Not all of us possess a DeLorean time machine stashed away in our garage that would enable us to travel to any time period in the future (or past). Till the moment comes when we can just buckle in and set the dial to 10 years from now, we need to equip ourselves with the right tools and skills to forecast for the future.

This was the theme of a sales & operations (S&OP) webinar led by two experts in the fields of forecasting and demand planning and hosted by DELMIA Quintiq and EyeOn. We've compiled their most valuable insights in this section.

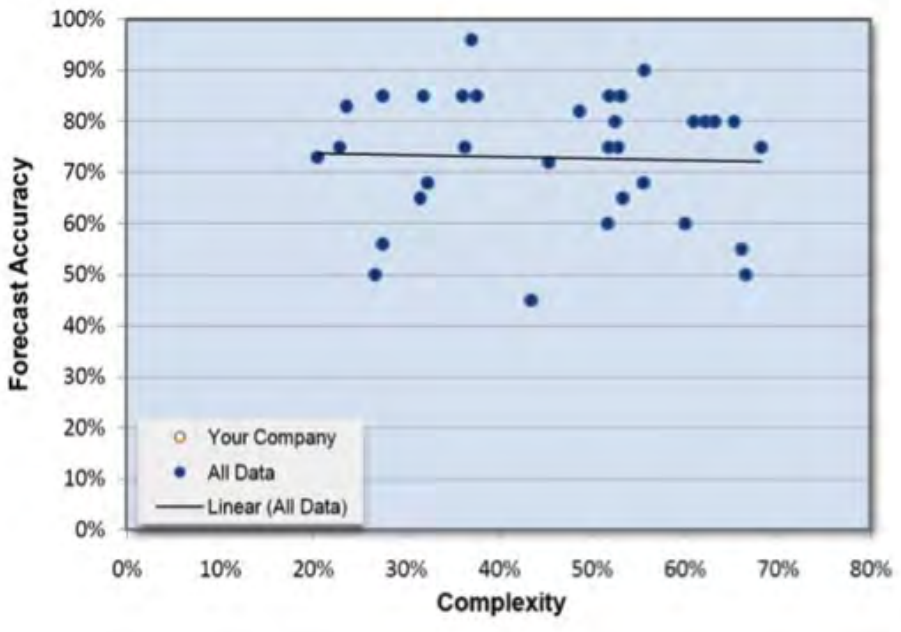
Improving your demand forecast is one of the best things you can do for your sales and operations planning

Forecasts are never 100% accurate

Research shows that most times, only a small percentage of forecasting is accurate. Why is this? Could it be that we didn't consider historical data and predictive analytics when forecasting? Not exactly. The truth is, we may never achieve a 100% accurate forecast but we can reduce the gap between the forecast and actual outcome. EyeOn describes a four-step process to fine-tune your forecasting results:

Collaborate

Information is key. You need to have as much data as possible from all areas of your supply chain. This is crucial for obtaining high quality demand signals and supply possibilities. Build relationships with your suppliers, and channel partners, customers and even internal departments such as sales & marketing. Collaboration between all links in your supply chain is essential to achieving solid forecast accuracy.



Forecast

It's not rocket science. EyeOn explains that investing in forecasting or demand improvement pays off. So how do you go about becoming an expert in forecasting?

First, supply chain complexity isn't a factor. Take a look at the figure below. EyeOn conducted a benchmark study with 90 companies to come up with a complexity measurement scale. This scale compared companies' complexity against the accuracy of their forecasts. It was found that companies with a complexity of more than 60% showed an accuracy of at least 80% in their forecasts. The conclusion? You can still achieve an accurate forecast regardless of the complexity of your business.

Second, these companies that achieved a forecast accuracy of 80% and more had typically designed and implemented a fit-for-use process. This process mitigates the impact of complexities on demand signals and is unique to each business.

EyeOn goes on to describe crowd forecasting as a great method to determine demand for new consumer-based products. Information collected from crowd forecasting contributes to a more accurate demand forecast.

What about your planners? EyeOn mentions that leaders in forecasting employ high quality planners with the right skill sets. Planners must have the ability to critically assess forecast information received. A study shows that planners who make large adjustments to the original forecast usually add more value. But planners who make small adjustments to the forecast tend to show little improvement and could even deteriorate the forecast.

The bottom line: Only hire planners who know what needs to be changed.

Monitor and control

A process to monitor and control deviations in demand and supply is essential to effective forecasting. Strict integration is needed in your operational systems to quickly respond to unexpected changes in demand and/or supply. Flexibility is key.

Shape

So you've got the first three steps down. Now comes shaping. You need to establish a process to enable quick, data-driven decisions that would optimize profit, based on the alerts received in monitoring and control. These decisions would shape demand management in your sales and operations process.

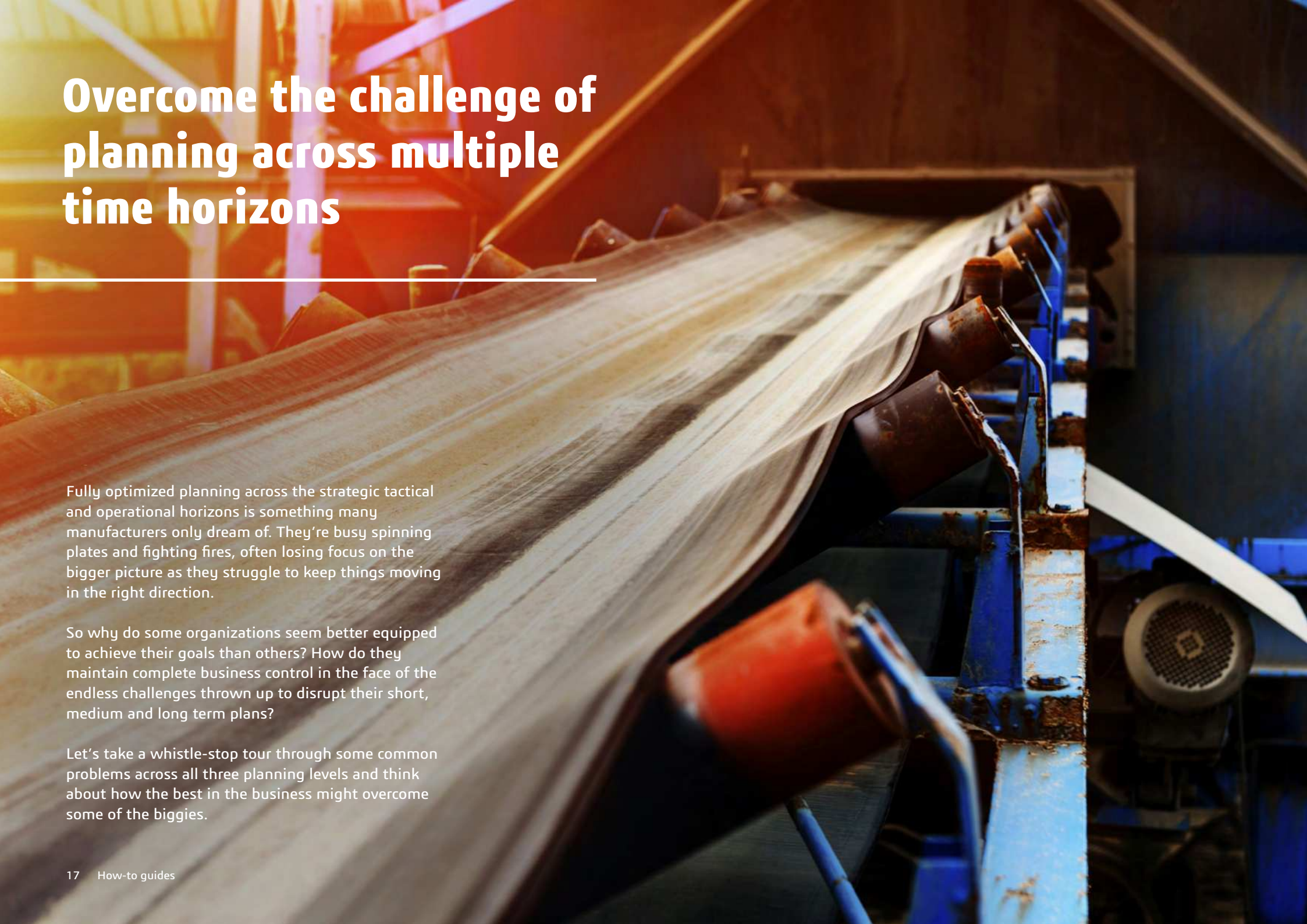
No, it's not just your company. At least one third of the participants in the recent sales & operations webinar use Excel as their sole tool in demand planning. Sure, if you're using a knife instead of a power-screwdriver, you'll get the job done, but how fast, how efficient, and how satisfactory is the end result?

Key takeaways for successful demand planning

Read on for more insights into becoming a demand-forecasting expert.

- Automate the forecasting process where possible.
- Combine multiple sources of information to improve accuracy of forecast.
- Use different but synchronized demand plans to support each planning level.
- Integrate your demand planning with sales & operations (S&OP) to close supply chain gaps and increase profitability.

Overcome the challenge of planning across multiple time horizons



Fully optimized planning across the strategic tactical and operational horizons is something many manufacturers only dream of. They're busy spinning plates and fighting fires, often losing focus on the bigger picture as they struggle to keep things moving in the right direction.

So why do some organizations seem better equipped to achieve their goals than others? How do they maintain complete business control in the face of the endless challenges thrown up to disrupt their short, medium and long term plans?

Let's take a whistle-stop tour through some common problems across all three planning levels and think about how the best in the business might overcome some of the biggies.

Strategic planning challenges

Challenges encountered on a strategic level include:

- Attempting to manage constantly changing supply chains
- Making the most of opportunities in emerging markets
- Deciding whether or not to outsource

That last one's an age old dilemma, but top manufacturers have the ability to make these judgments with minimum fuss.

Imagine this: A beleaguered component manufacturer is debating whether to scrap a cutting machine in the face of rising maintenance costs. A subcontractor offers to take on the production. The manufacturer's planners pour over spreadsheets of 'old' data and spend hours weighing up the pros and cons of accepting the offer. Even when they finally make a decision, they can't be 100% sure they've done the right thing.

So what do the big boys do differently?

They use straightforward "what-if" software simulations to explore the alternative courses of action and within a few clicks, they've worked out the most appropriate, cost-efficient thing to do. Job done.

Tactical planning challenges

These often seem to relate to a company's flexibility (or lack of it), especially when dealing with issues like:

- Invisible trends
- Production versus Sales standoffs
- Inadequate S&OP reaction speeds

When it comes to the S&OP 'blame game' (where Production blames Sales for promising more than the company can deliver, while Sales accuses Production of failing to manufacture enough product), nobody wins.

Missed targets stay missed, and interdepartmental 'them and us' attitudes certainly don't help solve the issue of how the misalignment came to be in the first place.

So what's the answer?

If you asked market leaders, they'd tell you of the need to employ an integrated S&OP process based on realistic forecasts, the latest data and finite capacity. When all departments have instant access to data, are up to speed, in agreement and committed to delivering their side of the bargain, S&OP meetings can be brief and rewarding—with finger pointing and frustration welcome absentees.

Operational planning challenges

While they may be less complex than those experienced when making longer term decisions, operational level problems can be just as disruptive. For example:

- Accepting large orders before capacity can be guaranteed
- Coping with machines which can (and will) breakdown
- Struggling to iron out wandering bottlenecks
- Aligning the schedules of tightly linked resources
- Determining optimum production quantities
- Determining optimum inventory levels

The challenge of synchronizing the schedules of tightly linked resources is something most manufacturers battle with. With intrinsically conjoined resources such as mixing and filling lines, it's nigh on impossible.

But there's usually room for improvement. A good planning system can help determine the ideal balance for all processes and suggest optimized schedules. This allows schedulers to visualize the impact of variables on all relevant KPIs, fine-tune plans and make excellent decisions.

Take some of the pain out of planning

The ability to overcome strategic, tactical and operational planning challenges is vital to any business. Being able to nimbly sidestep problems is also a major competitive advantage if your rivals have a tendency to falter or panic as their best laid plans go up in smoke.

The good news is, effective planning across all three horizons is something all manufacturers can accomplish. Achieving business goals can be a whole lot simpler.

You just need the right tools.

So if you've yet to invest in a good supply chain planning and optimization solution it's seriously worth considering. The initial outlay could be much less than you'd expect, and an integrated platform that supports every stage of your supply chain journey could save you big bucks and plenty of headaches in the long run.

It's not rocket science.

Unless you're in the business of manufacturing rockets, of course.

Improve supply chain operations by 5% or more

If you could do 5% more with the same resources, what would that be worth to your business?

Harness the power of supply chain planning and optimization to gain a competitive advantage

Supply chain planning and optimization software can evaluate vast numbers of alternatives in real time and optimize for the KPIs that matter most. For decades, ERP and SCM systems have helped corporations run more efficient and responsive supply chains. But times are changing. Companies need to fuel innovation, delight customers and fund both by improving efficiency. What if you had a solution that could help you with all the above and deliver at least 5% efficiency improvement?

ERP is commonplace for large corporations. The advantage these systems once provided has evaporated. It's time to look beyond your transaction system of record and seek innovation to deliver your next step change in competitive advantage.

Connect the parts to increase the value of the whole

Looking forward is more complex than analyzing the path that brought you to where you are today. Going forward, there are a nearly an infinite number of paths open to you but each decision narrows future options. You must choose wisely. Your organization's historical performance is not the best predictor of your future. Think about your real-time orders, logistics assets, production equipment and people. How well they can be synchronized in real time will determine your best future outcome.

Explore all possible scenarios to see more profit

Don't you want to ask "what if?" What if we opened another distribution center? What if we produced for another hour? What if we added a machine? Could we do the same or more with less of any asset? How would that affect critical KPIs? Being able to look into the future and to determine your most profitable path ahead of time is the capability that differentiates leaders from laggards.

Find unrealized profit

Today's supply chains are complex, regardless of whether you are in manufacturing, logistics or retail. Take a simple example: 1 depot, 6 trucks and 43 pickup delivery points. What is the most efficient set of routes for your vehicles? The number of possible solutions to this problem is roughly 1050.

Ramp up to a more realistic scenario of 100 trucks and 1,000 delivery locations. Factoring in real-world eventualities such as one-way streets, restricted tunnels, tolls, and the possibility of avoiding temporarily congested roads, and the number of possible routes, overwhelms the imagination.

The same applies if you are in production, managing sequences in your lines. Supply chain planning and optimization (SCP&O) software has the ability to evaluate vast numbers of alternatives in real time, and optimize for the KPIs that matter most. Unlike even the most skilful human planners, SCP&O systems can evaluate alternative scenarios at any point in the chain, and tell you what the effect of those scenarios are in terms of cost and revenue.

Highly talented and experienced planning professionals can reliably provide you with good schemes for logistics, as well as workforce and production scheduling. However, just finding a workable plan is a challenge, much less a highly efficient plan.

A good planner with a day to make a plan might be able to do it but do your planners have all day? What's a great plan worth to your bottom line? Plenty! SCP&O software consistently improves efficiency from 5% to 20%. If you could do 5% more with the same resources, what would that be worth to your business?

In today's competitive and volatile markets, a 5% to 20% advantage can translate to millions or tens of millions of additional profit annually. The millions that SCP&O software can save your business may enable you to make further investments that will keep you ahead of the competition.

SCP&O technology provides its greatest value during two critical phases of business development — increasing production to meet demand, and maximizing efficiency to fend off lower-priced competition in a mature market. Those are the phases where predictive capabilities make the most difference.

Even in industries that tolerate a certain amount of inefficiency, a leaner operation will always come out ahead and be more responsive to changing conditions. SCP&O technology can help ensure that you are getting the most out of all your company's assets, whether it's manpower or materials.

Tips & tricks

5 easy steps to profit with an integrated supply chain

Companies in vastly different industries can use similar techniques with their integrated supply chains to drive profitability. These techniques include leveraging the multiple perspectives that integrated supply chains provide on a business's operations, orienting the supply chain toward demand, constantly monitoring the best practices in supply chain planning and optimization, using the supply chain to reduce risk, and optimizing the supply chain for profit.

Businesses in diverse industries are coming to understand that supply chain planning and optimization serves not only the traditional demands of supply chain management — keeping costs down and efficiencies up — but also enables the supply chain to become a driver of growth. To realize the maximum value of one's supply chain, it must be as integrated as possible within and across all functional domains, from sourcing to procurement, logistics, management, and conversion.

An integrated supply chain unites all channel partners — suppliers, intermediaries, third-party service providers, finance, and most important of all, customers — and coordinates their actions. It orchestrates the flow of goods and services toward the customer, and the flow of information from customers, financial partners, and all the other channel participants back to supply chain planners. The flow of information through the system and ultimately to management facilitates the ideal of having all the items in the chain in the right place, at the right price, in the right quantity, at the right time.

A well-integrated supply chain can reduce time to commercialization, deliver greater flexibility in packaging and service, enable the efficient absorption of acquired business assets, and provide value at practically every step along the way. Successful businesses rely on their integrated supply chains to become leaders in customer service while consistently achieving their sales and profit targets — in part because supply chain optimization contributes to better sales and profit forecasts.

While best-in-class information technology is at the core of every well-integrated supply chain, no supply chain solution realizes its promise without intelligent and engaged management of the technology. Here then is a guide to getting the most out of your company's supply chain planning and optimization system.

When manufacturers have better information regarding their final customers, they can adjust and optimize their manufacturing and logistics schedules accordingly.

Step 1: Leverage multiple perspectives

The essence of an integrated supply chain is real-time access to pertinent and detailed information from all parties that participate in the chain. When manufacturers have better information regarding their final customers — such as buying patterns that include their products — they can adjust and optimize their manufacturing and logistics schedules accordingly. The same goes for information from their suppliers, their sales force, their financial department, and so on. Profiting from an integrated supply chain begins with examining your chain from multiple perspectives. Then, based on the priorities of your business needs, you can optimize your supply chain from the perspective of those needs.

Logistics

A relatively simple perspective from which an integrated supply chain can produce more profit is logistics. Technology such as radio-frequency identification (RFID) systems, vehicle-mounted transponders, and tablet computers have made supply chain transparency more practical than ever. Data from such systems allow logistics managers to precisely track items and vehicles in real time. Following shipments in real time allows managers at production lines, loading docks, distribution centers, shops, and other critical locations prevent bottlenecks, find alternate routes in the event of traffic congestion, fine-tune processes, and ultimately have a positive impact on profitability.

Sales and operations planning (S&OP)

This perspective encompasses more of an integrated supply chain's capabilities, as it combines several functional areas. While sales is responsible for identifying and closing new customers for a business's products or services, operations orchestrates the supply of the organization's goods to the customers. An integrated supply chain system can help set the overall production plan and associated activities to best satisfy the current sales plan or forecasts, while optimizing for such business goals as profitability, productivity, customer lead times, and so on. To get the most of out of S&OP, businesses deploy it as an iterative process. If resource constraints prevent production from meeting the sales targets, the sales plan is revised and the program goes through another cycle. Companies as different as cement manufacturers and telecom providers have optimized their integrated supply chain solutions from the perspective of S&OP, and reduced logistics costs, improved service performance, maintained better control of inventory, and more consistently met sales targets.

Concurrent engineering

This strategy combines the perspectives of marketing, product design, suppliers, and process design and operations to create a continuous stream of new products/services that best suit customer preferences and that outperform competitors' efforts in terms of cost and quality. Many businesses have used concurrent engineering to build a resilient competitive advantage. An integrated supply chain can draw relevant information from various functional domains to coordinate market demand, design expertise, raw materials, and manufacturing to reduce design schedules, lower costs, and simplify manufacturing and logistics processes. In industries where product life cycles are under constant pressure to speed up, concurrent engineering has proven its worth as a path to growth.

Step 2: Orient your supply chain to demand

Consumer packaged goods (CPG)

While an integrated supply chain allows you to gain insights from numerous perspectives on your business, and to combine and act on them to reach specific business goals, it can also allow you to orient or optimize your supply chain from a particular perspective. One such perspective is demand. Traditionally, however, most supply-chain managers oriented their systems from the perspective of supply. Each cycle in that approach began by assessing suppliers' capabilities and ended by analyzing how well the business is satisfying its customers' needs. This has an intuitive appeal, The problem with it is that it discounts the value of understanding customer motivation.

Gartner, Inc., perhaps the most respected company in supply-chain IT consulting, noted in its 2013 review of the top 25 supply chain leaders that "at the heart" of those exceptional companies "is the notion of demand-driven leadership." Driving an integrated supply chain from the perspective of customer demand or satisfaction puts the horse before the cart. You begin by assessing and quantifying how you can best serve your customers or end-users, and then develop an integrated means to realize that end.

Without an integrated supply chain it can be difficult or even impossible to realize the advantages of demand orientation. Limited communication from the end of the supply chain enables slight increases in demand to become magnified at each link up the chain, leading to overproduction, which often causes an overreaction and underproduction, with the whole scenario being known as the "bullwhip effect."

Demand-driven supply chains in the world of CPG typically involves acquiring and responding to increasing granular data from as far down the chain as possible. CPG companies profit from their integrated supply chains by relying less on distribution center sales forecasts and more on techniques such as vendor-managed inventory; collaborative planning, forecasting, and replenishment; and the use of point-of-sale (POS) data. In the first two techniques, manufacturers use information that retailers traditionally had provided only to distribution centers, giving them a higher-resolution picture of the demand signal.

POS data gives manufacturers their most granular view of demand. It can include not only the number of items sold, but also where they were sold, when they were sold, and in many cases the zip code of the person making the purchase. Planners can then use this data to determine demand patterns and develop models that enhance short-term forecasts. Demand modeling also allows planners to collaborate with retailers to optimize merchandizing strategies. Supply chain systems that can incorporate information such as demand responses to promotions and pricing policies allow CPG companies to devise demand-shaping strategies that can lead to higher profits.

High-tech

High-tech manufacturers face challenges in leveraging a demand-driven supply chain for profitability than do CPG manufacturers. Consumer demand for electronic devices is volatile, causing very short product lifecycles, while lead times for components can be relatively long. Large inventories of finished products in many cases represent an unacceptable risk. To minimize that risk while adapting to the long lead times for components, many high-tech manufacturers build inventories of semi-finished products that they complete only when favorable conditions of demand occur. A third feature that makes demand-driven supply chains for high-tech manufacturers unique is the multiplicity of distribution channels they use —retail, corporate/ industrial, and direct to consumer.

To profit from integrated supply chains oriented to demand, high-tech manufacturers leverage product design capacity to create many products from relatively few platforms. This allows them to respond with agility to shifting demand using stockpiles of components and semi-finished products.

Integrated supply chains allow these businesses to reduce their planning cycles and increase planning frequencies. The demand volatility common in e-commerce models results in a competitive advantage to companies that can deploy weekly tactical S&OP planning cycles with daily or even subdaily updates. With so many channels to satisfy, a demand-oriented supply chain is about more than just an inventory of finished goods. Leading high-tech manufacturers forecast at the level of options or subassemblies to implement build-to-order and configure-to-order

Step 3: Compare your supply chain capabilities and practices to the best in class

Supply chain best practices transfer surprisingly well across disparate industries and position in the supply chain.

Understanding the motivations of your customers is one thing. Figuring out how to capitalize on that understanding is another. Fortunately, much of that figuring out has already been done for you. You just need to find it and apply it to your particular situation. This may be easier than one might think at first, because supply chain best practices transfer surprisingly well across disparate industries and position in the supply chain. Most companies that perform assessments of their supply chain capabilities and practices do so with the help of professional supply chain consultants. Here are four opportunities for better profitability through tighter integration.

Product design and the supply chain

In most businesses, product designers pay too little attention to supply chain considerations, discounting the supply chain's contribution to overall profitability. Walmart's "square milk carton" is an admirable example of how tighter integration between product design and the supply chain can lead to better efficiencies in storing and transporting packaged goods, and more sustainability in the materials used for storage and transport. Tighter integration between retailers and product design can also result in improved efficiencies.

Thinking outside the silo

Many organizations are very good at optimizing work practices within functional silos. To take a simple example, sales attempts to maximize revenue while operations attempts to minimize costs. Fighting too hard for the immediate goal of one's own silo typically leads to conflict when the overall goal is profitability for the company. This is where effective S&OP comes into play. Profiting from an integrated supply chain means maintaining tight coordination between the requirements of demand and the capabilities of supply.

The physical network

Businesses need to regularly reassess the costs incurred by the locations of their distribution centers, manufacturing facilities, suppliers, and stores. With transportation-cost volatility resulting from fuel prices, environmental issues, driver shortages, infrastructure constraints, and so on, planners need the capability to perform what-if scenarios. These analyses can uncover opportunities for cost savings whether one is considering the day-to-day effects of workforce disruption or issues that play out over a period of years.

Outsourcing in a global economy

The economic viability of offshore outsourcing fluctuates over time. Given the volatility in fuel costs alone, any savings reaped from outsourcing can be outstripped by the costs of intercontinental supply lines. Companies considering outsourcing may also need to take unpredictable exchange-rates, political instability, and other such issues into account. The capabilities of today's integrated supply chains and their supporting supply chain planning and optimization systems can go a long way in quantifying the prospective savings, costs, and risks of outsourcing.

Step 4: Use an integrated supply chain to manage risk

A tightly integrated supply chain requires informational input from all trading and internal partners regarding demand signal, production capacities, and inventories across the network. Using that information toward the goal of greater profitability necessarily involves finding ways to reduce risk. Many of the techniques mentioned in these steps contribute to risk management, such as collaborative planning, forecasting, and replenishment. Another is segmenting customers according to criteria that make sense for your organization — for instance, by their requirements for delivery frequency and volume. Analyzing your customers for such criteria can enable you to offer discounts to high-volume customers, which could attract more of such customers, and reduce the risk posed by less-predictable customers.

Since Dell began segmenting its customers into consumer, corporate, distributor, and retail groups, it has saved $1.5 billion in operational costs, and achieved the number two spot on Gartner's Supply Chain Top 25 list.

For global companies, natural disasters, such as the Tōhoku earthquake that devastated northern Japan in April of 2011, can pose considerable risk. While such disasters cannot be predicted with precise certainty, they and other destructive phenomena such as hurricanes, tornadoes, and wildfires are subject to statistical predictive methods. At least one global company has used its integrated supply-chain system to calculate the probable risk of such disruptions to its supply chain, and develop a contingent network of alternate suppliers that could keep its manufacturing facilities on line in the event of a disaster striking a primary supplier.

Another method in which global businesses use an integrated supply chain to reduce risk relates to demand orientation. These businesses are sourcing an increasing proportion of their supplies in growing markets, such as Brazil, China, India, and Eastern Europe. Such a strategy clearly mitigates the risk posed by volatile transportation costs, and can also reduce the risk posed by political instability and an unpredictable regulatory environment. For these and other risks, having a contingent network of suppliers, held together by an integrated supply chain system and an SCP&O system that can change plans in real time, can keep your business profitable while others must wait for conditions to return to normal.

Reducing risk in your supply chain can also confer a significant competitive advantage. A Deloitte survey of global executives found that 53 percent of them acknowledged that disruptions to the supply chain have been increasingly costly, and 48 percent said that the frequency of such events had increased over the past three years.

Step 5: Optimize your supply chain for profit

Staying focused on the demand signal and using SCP&O software to adjust plans to account for changes and disruptions will help to keep production at the most profitable levels.

Traditionally, the primary concern of a supply chain was to move supplies and products around in a coordinated matter, with the notion of leveraging the supply chain as a competitive advantage being an important, but secondary consideration. SCP&O solutions now allow businesses to flip those priorities, to use the supply chain foremost as an enabler of growth, and secondarily as a transportation network.

Profit-centric supply chains focus on optimizing financial metrics such as profit, working capital, and costs, and they do this by balancing three concerns: Product cycles, market cycles, and local market dynamics. Products typically go through the cycle of development, introduction, growth, maturity, and decline, with the growth and maturity phases bringing the greatest return. Here the goal is to maximize the contribution of those two phases. During market upturns and downturns, businesses must manage pricing, promotions, capacity, and production to optimize market share, brand positioning, profitability, and working capital. As for local market dynamics, they are local and often unique. This is another instance where having demand-oriented practices and forward looking SCP&O solutions in place pays off.

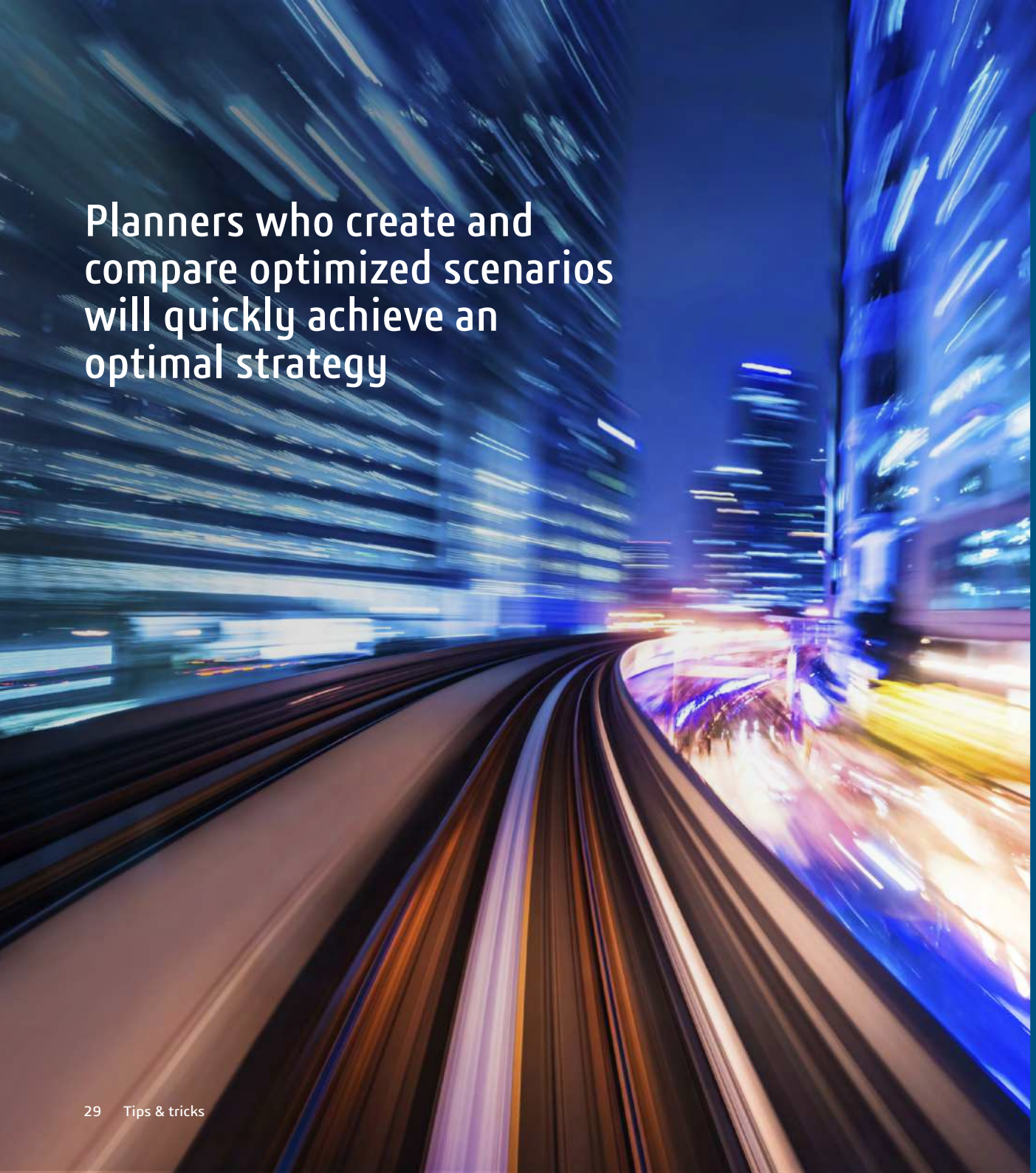
A proven strategy for capturing the promise of a profit- centric supply chain begins by optimizing the local profitability of key products in the biggest markets.

Use pricing, promotion, and distribution to position the products as means to reach strategic and financial goals while using SCP&O to minimize logistics and transportation costs.

The next element of this strategy is to roll out the key products in phases to other markets while optimizing your supply chain for profit. Here you need to balance the cost of transporting products across markets with the profitability of doing so.The use of SCP&O software allows planners to conduct what-if scenarios, change plans on the fly, and visualize the ripple effects of any planning decisions immediately.

The third element involves a continuous fine-tuning of the supply chain, balancing its ability to drive the global market with its need to respond to it. Successful practitioners of this strategy stay ahead of changes through excellence in planning. Staying focused on the demand signal and using SCP&O software to adjust plans to account for changes and disruptions will help to keep production at the most profitable levels.

Integrated supply chains are dynamic and multidimensional. They require the real-time collection of vast amounts of granular information, and the ability to optimize production, logistics, and transportation in support of a business's strategic and financial goals. Companies in vastly different industries can use similar techniques with their integrated supply chains to drive profitability. These techniques include leveraging the multiple perspectives that integrated supply chains provide on a business's operations, orienting the supply chain toward demand, constantly monitoring the best practices in supply chain planning and optimization, using the supply chain to reduce risk, and optimizing the supply chain for profit. A vast wealth of expertise in integrated supply chain management is available, and successful strategies continue to evolve as system capabilities advance and market conditions change.



Planners who create and compare optimized scenarios will quickly achieve an optimal strategy

12

tips to recharge your supply chain

Ready to supercharge your supply chain? There's no better time than the present. Here are 12 actionable tips to revitalize various aspects of your supply chain.

Supply chain visibility: Not for your eyes only

Tip 1 Make sure you can see what's happening — always

How certain are you that the due date you are about to quote is accurate? Spreadsheet-based planning — and even certain sophisticated planning tools — can fail to give you the visibility you need to check the accuracy of your delivery dates. Stick to capacity planning tools that provide visibility into your production processes, automatic alerts on inaccurate data input, and immediate insight into the causes of delayed orders.

Tip 2 Create better plans with end-to-end visibility

Some businesses attempt to reduce complexity by assigning different parts of their planning challenge to different departments. This rarely works. It's difficult to make decisions in real time when one planner doesn't know what the planner in another department is doing.

Power up your sales and operations planning (S&OP)

Tip 3 Match the scope of scenarios to different planning needs

A common mistake is to merge an organization's long-term strategic plan with its monthly S&OP plan. This may sound appealing, but in reality, all-encompassing scenarios greatly complicate scenario planning while adding no value. The bottom line? Don't squeeze all your data into one big scenario. Use different scopes, with different levels of detail, for different planning horizons.

Tip 4 Create single demand forecasts that cover multiple channels

To improve demand planning and forecasting, managers must look towards improving collaboration internally. This means that creating forecasts and promotional and pricing plans must be integrated with functions including distribution, operations planning, and manufacturing.

Tip 5 Close the inventory gap between model and reality

Flawed inventory data leads to plans that are of little practical use. Unfortunately, some companies begin their S&OP process by assuming that their inventory levels are exactly right, or that they have no inventory at all. You need to use actual inventory levels, and distinguish between ordinary stock and stock that cannot be freely allocated to demand.

Tip 6 Break down the demand plan

Scenario planning empowers you to explore how changing demands will affect different parts of your business. Breaking down the demand plan into business units, value streams or geographical entities reduces the complexity of forecasting.

KPI-based planning: It's easier than you think

Tip 7 — Optimize plans based on critical KPIs

For example, if a higher yield is required, your planners should be able to tweak the optimizer to achieve that. Many planning tools are optimized for very specific cases, but fail when the problem is even slightly different. Look for solutions that capture all the relevant rules and accommodate new ones easily. Planners who can create and compare optimized scenarios quickly and easily are more likely to arrive at the optimal strategy.

Tip 8 — Define KPIs that link planning decisions with business goals

Take, for example, a homecare service that needs to schedule its caregivers. Here, sequencing (a planning decision) is strongly related to productivity (a business goal). Changing the task sequence of a caregiver will affect the interval time between tasks, and thus productivity. The bottom line? Take steps to determine the impact of your planning decisions on relevant business goals.

Tip 9 — Keep your planners in control with KPI-based interactive automation

In the world of intermodal logistics, for instance, there's rarely a plan that optimizes all your KPIs. In situations where there is no clear winner, your planner knows better than the system which KPIs to favor. For example, if you need to focus on meeting a tight delivery window for a certain customer, a planner can take this into account and select the optimal plan under those special circumstances. Choose optimization approaches that enable your planners to stay in control.

Bonus tips for optimizing your supply chain planning

Tip 10 — Eliminate silo processes to ensure timely and effective planning

Centralized planning enables planners to start optimizing their plans as soon as a certain percentage of orders comes in. These plans are then re-optimized as new orders arrive — right up to the final order. Centralized planning also gives depot planners advance warning of unforeseen events so they can re-plan to minimize disruptions.

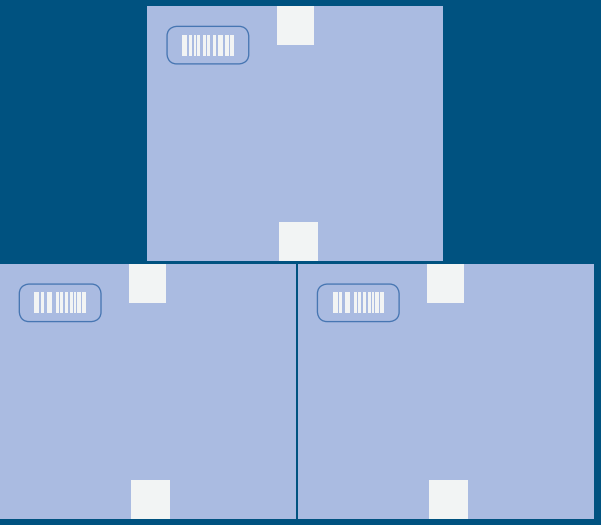
Tip 11 — Know what you are measuring

Having a measurement plan in place is critical to ensure that business goals are actually being met. Measurements should be made at intervals determined beforehand, with typical samples varying from hourly to weekly. Lastly, results need to be displayed in a way that allows planners and key stakeholders to easily evaluate operational performance and compare it against the forecasted scenario.

Tip 12 — Break common planning rules

When it comes to logistics planning, there are many rules-of-thumb that you may follow. But do you know when your practices are actually driving up — rather than cutting — costs? What sounds good in theory may in fact be costing you time and money.

5 tips on optimizing inventory in S&OP



Maximize your cash flow and profitability

Optimize your inventories for improved service levels and greater

Many companies neglect inventory in their S&OP (sales and operations planning). This is a pity. Paying the right kind of attention to inventory can drive down inventory levels, improve service performance, and increase profitability.

Five essential tips

Mastering the conflicting requirements of low inventory levels and high delivery performance is a worthwhile challenge.

Studies have shown that best-in-class companies evaluate and optimize inventory, in addition to their service policies, in order to maximize cash flow and profitability as part of the S&OP process.

Here then are our top five tips for ensuring that your S&OP process delivers optimal inventory levels.

Tip 1 Begin with your desired customer service levels

In certain industries, production departments still set inventory levels. This sub-optimal approach is no longer viable in today's hypercompetitive global marketplace. To ensure that you can deliver the right product at the right time, base your inventory targets on your desired customer service levels. These service levels should reflect your unique business rules, such as ABC customer classifications.

Use your desired customer service levels to set your inventory targets.

Companies rarely factor the true cost of WIP in their decisions.

Tip 2 Specify inventory targets dynamically

Using "days of cover" instead of absolute numbers creates an automatic link between inventories and demand forecasts, and ensures that inventory levels throughout the supply chain are driven by demand.

This coupling of supply and demand removes the need to revise inventory levels at every S&OP session. Another benefit: Inventory levels of slow-moving items will eventually fall over time.

Use "days of cover" to create a dynamic link between inventory and demand.

Tip 3 Use an appropriate level of aggregation

Inventory should be managed at the right product level. If the level of detail for inventory targets is inappropriately high, buffers have to be introduced to compensate for the uncertainty. This almost inevitably leads to excess inventory.

Let go of unnecessary detail. Use a level of aggregation that reflects your most significant constraints.

Tip 4 Close the gap between model and reality

Flawed inventory data leads to plans that are of little practical use. Unfortunately, some companies begin their S&OP process by assuming that their inventory levels are exactly right, or that they have no inventory at all.

Similarly, if 30% of your stock is slow moving, at least 30% of your inventory should not be allocated to demand. Another way of dealing with "dead" stock is to set a minimum inventory level that never dips below 30%.

Use actual inventory levels, and distinguish between ordinary stock and stock that cannot be freely allocated to demand.

Tip 5 Assess the true impact of inventory-related decisions instantly

One aspect of inventory that is often ignored is work in progress (WIP): Inventory that may, for example, be in transit on a ship. Although the lead time involved in holding this inventory has financial implications, companies rarely factor the true cost of WIP in their decisions.

Require immediate access to your true inventory-related costs.

Optimizing inventory in S&OP can be tricky. Implementing these tips will help you attain optimal inventory levels, increased customer satisfaction, cash flow, and profitability.

4 tips on choosing a supply chain planning and optimization (SCP&O) solution

The difference between a good supply chain planning and optimization (SCP&O) solution and a great one can be significant. Here's what to look out for.

You've heard of the benefits. You've seen how supply chain planning and optimization (SCP&O) is helping businesses like yours optimize resources and minimize costs. Now you're thinking of implementing SCP&O in your organization. The question is, 'Which SCP&O solution?'

The four tips

These insights have enabled successful SCP&O implementations in over 70 countries. Here's how you can improve your chances of finding the right SCP&O solution for your company.

Tip 1 Consider whether you need an out-of-the-box solution, bespoke software — or the best of both worlds

Do you have a small business with simple processes?

If so, an out-of-the-box solution may provide the best ROI:

- The smaller the scale of your operations, the smaller the savings generated by increases in efficiency. In such cases, a good enough fit may achieve a higher ROI than more sophisticated approaches.
- It is easier to adjust simple business processes to an out-of-the-box solution.

Do you have a large business with complex processes?

i. A bespoke solution will help you achieve vital productivity improvements. However these custom approaches come with significant drawbacks:

- Long development periods
- High total cost of ownership
- Uncertainty with respect to upgrades and support

ii. An attractive alternative to a bespoke solution is a best-of-both-worlds approach that maximizes your savings by:

- Combining the advantages of out-of-the-box solutions and bespoke software
- Avoiding the drawbacks of both

A best-of-both-worlds approach delivers standard software that is easy to maintain yet flexible enough to capture your unique business model — the very thing that sets you apart from your competitors.

Tip 2 Pay close attention to the user interface and level of decision support

All the information required for a decision should be visible at a glance, and presented in a way that facilitates planning. Planners should:

- Get instant feedback on the quality of their decisions in the form of KPIs that capture your business goals.
- Be supported by automatically generated plans that
  - optimize KPIs, and
  - minimize violations of business rules and constraints.
- Be informed of all the consequences of any disruption, and receive suggestions on how to minimize their impact.

Tip 3 Prefer approaches to optimization that keep your planners in control

Effective optimization takes all the complexities of your unique business model into account. For example, there may be circumstances where some of your business rules should be overruled by other considerations. Breaking these rules has an associated cost that the optimizer should consider in arriving at a solution.

However, this theoretically optimal solution may not always be the practically optimal one. Under special circumstances, planners should be allowed to override solutions suggested by the SCP&O system.

For example, in a situation where it is clear that some orders will be late, the planner — but not the SCP&O system — may be aware that certain customers are willing to tolerate late orders.

A second reason: Disruptions may make it impossible to optimize the entire plan. Planners who can choose where to apply optimization will be able to react swiftly to unexpected events and minimize their impact.

Tip 4 Require proof

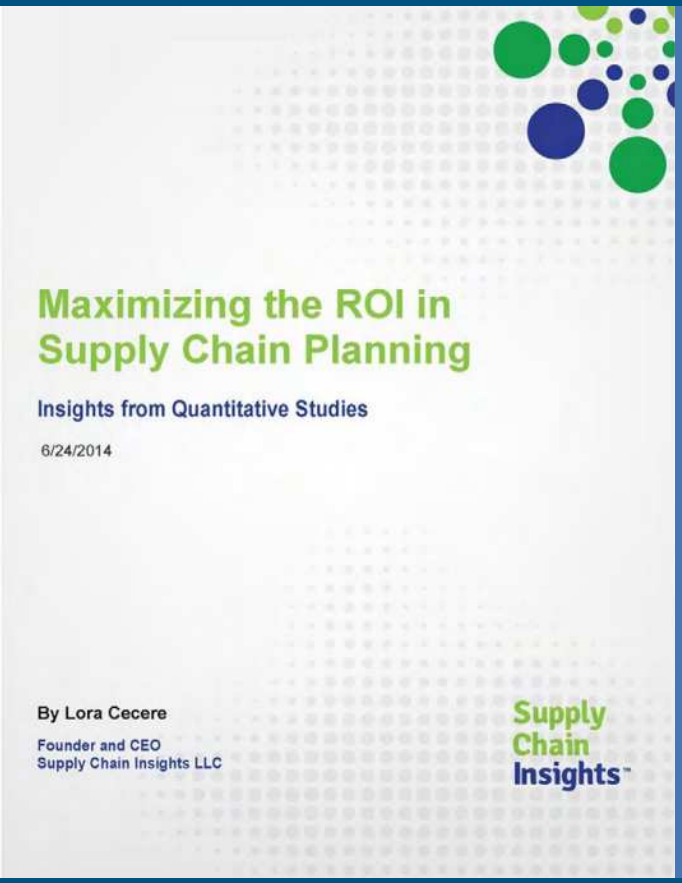
Don't assume that a particular SCP&O solution will realize considerable savings for your business. Ask for a proof of concept that uses your data and captures your business rules and constraints.

An effective proof of concept should:

- Solve some of your most pressing planning and scheduling challenges.
- Indicate the quantifiable returns you can expect from a full solution.

Ask for a proof of concept that uses your data and captures your business rules and constraints.

Selecting a supply chain planning and optimization (SCP&O) solution can be easy once you know which features are important, and why.



Bonus material

Maximizing the ROI in your supply chain, by Lora Cecere

As a bonus, we've included a 30-page report from Lora Cecere at Supply Chain Insights on maximizing the ROI in your supply chain planning.

Did you know, your competitors are getting a return on investment from their supply chain planning technology within just 7-12 months?

In this report, Lora Cecere from Supply Chain Insights shares the results of recent research into how to maximize the ROI on your SCP investment. Find out:

- What are the three barriers to maximum ROI and how to overcome them
- How to improve supply chain planning investment decisions
- Why supply chain implementations succeed—and fail

View the report >>

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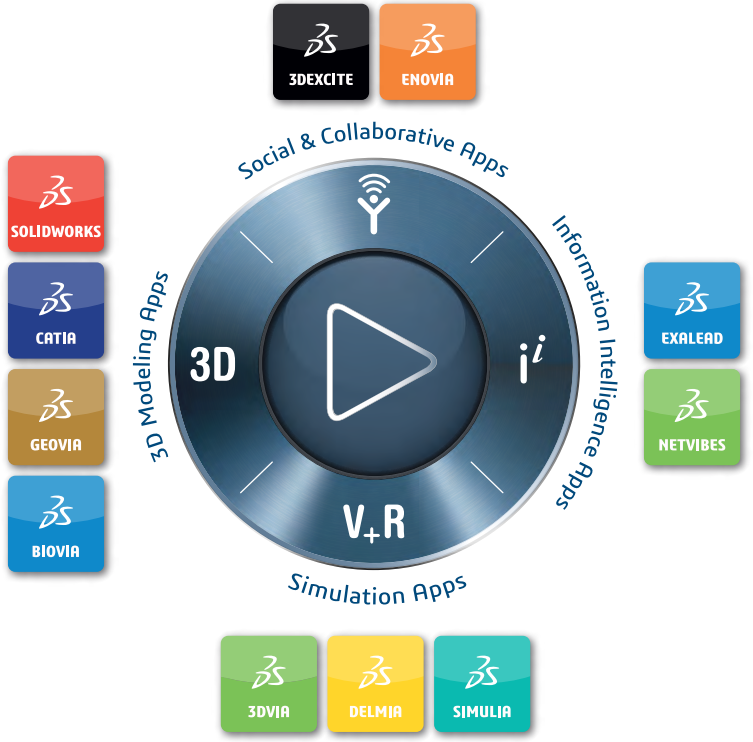

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